1: Karsten--103 (1916-18) 1935 Jivaro
278, 462, 791 (1928-29)

"To the rule that clay vessels shall be made by the women there is, as far as I know, only one exception: the cooking-pots in which the arrow-poison is boiled must be made by the poison-cook himself, who is a kind of medicine-man. The same holds true of the small pots in which the prepared arrow-poison is kept. As we shall see later on, no woman is allowed to come into any contact with the arrow-poison or the 'sacred' vessels used for its preparation."

1: Karsten--143-145 (1916-18) 1935 Jivaro-1
116, 278, 171 (1928-29)

"The arrow-poisons in vogue among the Indians of Western Amazonas seem to belong to the class known under the general name of 'curare', [144] of which one of the most important ingredients is the alcaloid poison found in various Strychnos species. The Macusi Indians of Guiana are the best known of the South American arrow-poison makers, and it is possible that this invention--one of the most ingenious of those of savage peoples--was originally passed on to the Indians of the Amazon territory. However this may be, it must be stated at once that even in Eastern Ecuador and Peru the 'curare' poisons differ considerably; nay, there are even arrow-poisons of which we do not know with certainty whether they can be called 'curare' at all, for instance the one used by the savage Avishiries living in the region of the river Curaray and its affluent Villano. According to the statements of the rubber collectors who have been in contact with this little known tribe, their arrow-poison is exceedingly effective, and their blow-guns, which I have seen myself, are of a type differing greatly from those used by other Indian tribes in the Ecuadorian Oriente. In general, the arrow-poisons used by the Indians of these regions are very imperfectly known, so that the information I was able to gain about those in vogue among the Canelos Indians and the Jibaros of the Pastaza, although incomplete from a pharmacological point of view, may be of considerable interest.

Although all Indian tribes of Western Amazonas use arrow-poison, only a few of

them make it; most of them seem to obtain it by way of inter-tribal trade. This is indeed quite natural, considering that the vegetable ingredients necessary for its preparation cannot be obtained everywhere even in tropical South America. But it should also be remembered that the preparation of the arrow-poison is regarded by the Indians as a secret requiring great skill and experience and therefore is necessarily limited to certain tribes, or rather individuals of certain tribes, who make it a profession. Just as there are tribes particularly skilled in making pottery, so there are professional poison makers who jealously guard the secret of their art. Other tribes may prepare the poison, but they do not know how to make it effective enough and therefore prefer to buy it from their neighbours or other tribes who make a stronger kind. Moreover, a tribe may be particularly famed for its poison, if there arises in that tribe a poison maker who acquires greater skill in that art than the rest. The professional poison-maker is always a kind of sorcerer and in the same social position as a medicine-man; other members of the tribe as a rule know nothing of his secrets. This was particularly pointed out to me by a medicine-man at Canelos and by the Jibaros of the Pastaza. [145]

The Canelos Indians, or rather some of them, are quite skilled in the preparation of the arrow-poison and make it the object of a sort of trade with neighbouring tribes.

Yet they frequently buy another and stronger kind from a half-civilized tribe on the Huallaga south of the Marañon whom they call Chasutas and who are renowned as skilled poison-makers. These as well as the Ticunas, another tribe on the Amazon, are--or were formerly--the chief makers of poison in the upper Amazon region. The Canelos Indians try to imitate the Chasutas, but they confessed to me that they are not able to make the poison equally strong because, as they said, 'the Chasutas mix certain other ingredients in their poison which they keep secret and which, perhaps, do not exist in our country at all'. According to Chantre y Herrera the strong Ticuna poison was made of 'more than 30 herbs, fruits, and roots'(1) and about the same number of vegetable ingredients are used in preparing the poison of the Canelos Indians."

"1. Chantre y Herrera, Historia de las misiones de la Compania de Jesús en el Marañon Español, p. 87."

1: Karsten--145-149 (1916-18) 1935 Jivaro-1
116, 278 (1928-29)

"Naturally, to be able to study the Indian arrow-poison properly, one needs to be, not only an ethnologist, but also a botanist and pharmacologist, and since I am not an expert in the latter respect, my study of the Indian arrow-poisons must be imperfect. Only in exceptional cases have I been able to identify scientifically the plants which the Indians use for the purpose. As a rule I can only give their names in the language of the Indians and a short general description--e. g. whether a vine, a shrub, a big tree, and so on--as well as the necessary data for preparing them in order to obtain an effective arrow-poison. Yet even so I believe I have done future students of the Indian arrow-poisons a good service, since a botanical expert, guided by my data, will, helped by the Indians, easily obtain the necessary material for his investigations. Considering the very imperfect knowledge chemists and physiologists at present possess of the vegetable ingredients of which, for instance, the so-called curare poison is composed, I can only hope that some properly trained botanical expert may some time have an opportunity to study them on the spot. It would also be very important to obtain and bring home, not only, as hitherto, samples of the prepared poison, but all those different vegetables from which the different tribes prepare it, and to have them separately examined. Only in this way can it be established, for instance, which ingredients have really practical effects, and which are, perhaps, only used for superstitious reasons.

[146] I shall first give an account of the mode of preparing the arrow-poison among

the CANELOS INDIANS.

These Indians prepare their poison from 25 to 30 different ingredients, all of which are obtained from the plant world. Of these at any rate the most important I noted down. My Indian informant, although himself an old poison-maker, declared that there is scarcely an Indian who can from memory enumerate all the plants required in preparing the arrow-poison. As they roam about in the forest in search of the necessary material they recollect, little by little, in conversation with one another, the different vines, roots, herbs, and other plants which will produce the desired result.

The Canelos Indians, just as other Quichua-speaking Indians of the Ecuadorian Oriente, call the poison pucúna hámbi. Pucúna is the name of the blowgun with which the poisoned arrows are blown; hambi is the general name for a magic medicine to which supernatural powers (due to the presence of a spirit or demon) are ascribed. The name hámbi is applied both to real drugs and remedies obtained from the plant world and to poisons like the arrow-poison.

The Indians of the Napo and some Canelos Indians call their arrow-poison ticúna, because formerly they obtained it from the Ticuna Indians on the Amazon.

Huásca is the Quichua name for a 'vine' or 'liana'; rúya signifies any 'big tree' with a straight stem, whereas cáspi is a more general name for a 'tree' or 'shrub'. Múyu is the 'fruit' of a tree or the 'seed' of a plant; cára signifies the 'bark of a tree'.

1: Karsten--145-149 (1916-18) 1935 Jivaro-3
116, 278 (1928-29)

The following plants and trees, with their Quichua names, are those used by the Canelos Indians in preparing the arrow-poison.

1. Varváscu. This name includes two or three different plants which are also used in fishing, the fish being stupefied with the poisonous juice squeezed from the root. The plant used for the arrow-poison is probably Cracca toxicaria, a small, leguminous bush containing an alcaloid called rotidona. In order to get the juice, the root is crushed with a club and boiled for a while in a special pot; when the poison is extracted, the roots are taken out, leaving the liquid.

2. Hámbi lállu is a bush, growing wild; its poisonous properties are obtained as follows: - - a piece of the stem is cut off, the bark removed and thrown away, the wood substance crushed and boiled for some hours. [147]

3. Pála huásca is a big flat liana, about 12 to 15 cm. in breadth, which creeps up the giant trees of the virgin forest. Because of its flatness it is called 'the shovel-liana' (pala ='shovel'). A piece of the stem is cut off, crushed with stones and boiled for some two hours in a special pot.

4. Cáñu huásca, a liana of about the same size as the pála huásca. Along the middle of this liana there runs a deep channel from which it takes its name (cáñu ='channel'). Cáñu huásca is prepared in the same way as the pála huásca.

5. Payángshi is a big yellow liana creeping under the earth. A small sprout pro-

truding from the earth indicates its presence. It is prepared in the same way as the lianas already mentioned, a piece of the stem being cut off, crushed and boiled.

6. Ilúchi is a small shrub. There are two species of it, differing in size, the larger being called hátun ilúchi (1) about 1 1/2 m. long, the smaller one, uchílla ilúchí, about 1/2 to 1 m. long. The root of both these shrubs is used; the bark is useless, and is therefore scraped off and thrown away; the yellow substance under it is taken out and boiled for a while.

7. Tunísh pa huásca (tunishpa ='mixed') is a shrub which is so called from its resemblance to the shrub ilúchi. When it is used for arrow-poison the bark is scraped from the stem and boiled.

8. Ápa huásca (ápa= 'old', 'ancient') is a big liana prepared in the same way as the pala and the cañu huásca.

9. Cüilin huásca (cüilin= a bird of the tucan family) is a small liana, about 3 to 4 cm. in diameter and is prepared in the same way as ápa huasca and the other lianas.

10. Hámbi huásca is a long thick liana creeping up the biggest trees of the virgin forest. At the top it is thicker than at the lower end, and the thick parts of the stem

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"1. hatun ='big', uchilla ='small'."

are especially used. A number of small pieces are cut off by two Indians, so many that they are quite a burden. These pieces are prepared in the usual way, i. e. crushed with clubs and boiled for a while in a small pot. The woody pieces are then taken out leaving the liquid.

11. Lispúngu múyu. Lispúngu is the name of a tall, thick tree of the forest with fruit about the size of that of the gourd tree. The fruit is cut up, the small seeds taken out, ground, and boiled separately in a special pot. Then the liquid is strained through a piece of linen and the essence carefully pressed out. [148]

12. Hámbi múyu. Of this plant there are three species, of which two are used for the arrow-poison. The one is a tree called hátun hámbi múyu the other is a shrub called uchílla hámbi múyu: of both the red and comparatively small fruit is used. In preparing the hátun hámbi múyu, the fruit is cut open, its seeds taken out and ground. A considerable quantity, say a small wooden basin full, of these ground seeds is boiled in a special pot, then it is strained and the essence, which is white, pressed out just as in the case of the lispúngu múyu.

In using the uchílla hámbi múyu the small red fruit is cut open and the seeds taken out and ground.

13. Tarapútu cara is a vine the leaves of which are similar to those of the tarapoto palm. There are several varieties of this vine and all of them are used in preparing

the arrow-poison. The black bark is scraped off the vine with a knife until the desired quantity has been obtained; this is then boiled.

14. Cicuánga caspi, 'the tucan tree' (cicuánga = 'tucan') is a beautiful high tree. A certain quantity of the bark is scraped off and boiled.

15. Hámbi cára cáspi. A small shrub. The rind is scraped off and prepared exactly in the same way as the Cicuánga cáspi.

16. Yána hámbi cáspi. A small shrub. The root of it is used, being crushed with a club and boiled, just as was done with the rind of the hámbi cára cáspi and other shrubs.

17. Chilíca cáspi. A big tree. The bark is scraped off and prepared in the same way as the previous ones.

18. Chíhun cáspi. A shrub. The root is cut into small pieces and boiled for about half a day in a special pot until its poisonous juice is set free, in the form of a concentrate.

19. Ahuiríngri caspi. The ginger shrub (Zingiber officinale?). The root is cleaned and boiled for about two hours.

20. Hámbi pahuága. A big tree. The thick bark is detached from the stem, crushed with stones and boiled.

21. Mándi. There are two species of this plant. The one is small with edible fruit

and leaves, and cultivated by the Canelos Indians for its nutritive value. The other one is bigger and poisonous and only used in the preparation of the arrow-poison. The rind of the stem is taken, carefully cleaned, and then boiled.

22. Pála pánga rúya. A small shrub of which the root is used. Up to ten roots are taken, the small fibres separated and boiled in a special [149] pot on a slow fire for a long time--nearly two days; a concentrated poisonous liquid results.

23. Huaránga quihua. A small plant of which the root is boiled.

24. Hámbi útchu, Indian pepper (Capsicum). The Indians cultivate different species of Capsicum. The one called hámbi útchu is small, yellow in colour, and so strong that it cannot be used as spice. It is exclusively used in preparing the arrow-poison. The whole fruit is boiled for a while and then mashed.

25. Matíri útchu, another kind of Capsicum. This is bigger than the hámbi útchu, red in colour, and also used as spice. When it is used for the preparation of the arrow-poison the seeds are taken out, mashed, and boiled in a little water.

Of these liquids and mashes nearly all, after being boiled separately, are placed together in a large pot for further boiling.

The exceptions are:--

No 10. Hámbi huásca--the liquid obtained is evaporated over a little fire until only a small concentrate is left, and this is dropped into the large pot, a little at a time.

No. 12. 2nd species--uchílla hámbi múyu--of which the ground seeds are placed in the large pot without being boiled first.

After thus learning the different plants which yield the ingredients necessary for the arrow-poison, we must examine somewhat more closely how the poison is prepared and what ideas the Indians associate with it."

1: Karsten--149-152 (1916-18) 1935 Jivaro-1
116, 278, 754 (1928-29)

"The poison cook is not an ordinary medicine-man, he is nevertheless a kind of sorcerer, since the making of the poison, as we shall presently see, is a sort of magical or religious ceremony. It is clear that the poison can only be prepared by a man who possesses the necessary knowledge and experience. Among the Canelos Indians the poison cooks are generally two men, both elderly, who know how to influence the particular demons active in the poisonous plants. The cooking cannot take place in the house, but only in the forest, where the sorcerers can enter into direct communication with the spirits of the plants. Similarly, the pots in which the poisonous ingredients are boiled must be specially made for the purpose by the cooks themselves. Pots which have been previously used [150] for other purposes, for instance for cooking food, will not do. Ordinary cooking pots would also be useless because of the salt which the Canelos Indians put into their food, for salt, which is regarded as an antidote against the arrow-poison, must not come into contact with it. The poison cooks prepare themselves for their work by fasting one day previously, being allowed to eat only roasted green plantains without salt. Nor can they have intercourse with their wives.

The cooking takes place in a shelter of palm leaves made in the interior of the forest about half a day's march from home. At a short distance from this shelter, nearer to the home, there is another shelter. The latter may be visited by other men and even boys who help in the work by carrying pots and fuel, and especially by bringing

the enormous quantity of material of all sorts of lianas, roots, fruits, and rinds from which the poison is prepared. Into the second shelter where the cooking takes place, only the two poison cooks may enter. Women again are strictly forbidden to come near either of the shelters and must keep away from the work as much as possible.

Four large new clay vessels, like those used for brewing manioc-beer, are necessary for the boiling. These are brought to the second shelter by the poison cooks, who also carry thither the different plants required, and these are already partly prepared.

The cooking requires a period of eight days in all. The first two days are for the preparation of the material, since, as we have seen, the numerous plants, roots, and lianas have first to be cleaned, peeled off, mashed, and so forth. This rough work is mostly done in the first shelter and, as already mentioned, even boys may assist at it.

The cooking can only take place at night, and the fuel used must consist solely of the hard wood of the chonta palm; only thus, it is believed, will the poison be effective. Towards the night of the second day the fires are kindled, the boiling begins and continues the whole night until dawn. Nothing further is done during that day, but on the following night the cooking is continued. After the poison has thus boiled for two successive nights, there is an interval of two days and two nights during which it is untouched. Then the cooking begins again and continues for two successive nights, when the cooking is finished and the poison is ready.

During the whole of the boiling only a small fire is kept burning; the process must be slow and gradual. When different poisons are boiled together in the big pot, the boiling is done over a slow fire until part of [151] the liquid evaporates and it becomes as thick as syrup or honey. The colour of the arrow-poison when boiled is dark brown.

All this time the cooks remain in the forest. They have to fast strictly, being allowed to eat only two roasted green plantains a day without salt; they are also allowed to drink manioc-beer. This food, however, must be consumed in the first shelter whither it is brought by a man; in the shelter where the cooking is done they may not eat or drink anything. If they do not fast strictly, and particularly if they eat salt or sweet things, the poison will be useless. During the work the cooks chant conjurations and incantation formulae by which the demons (supai) of the poisonous plants are summoned and favourably influenced. Besides this, they may speak only when absolutely necessary and then they must talk in a subdued voice.

Those days when the cooks are not engaged in boiling the poison, they are busy carving the arrows for which the poison is to be used.

They are strictly forbidden to have intercourse with women, and the latter, as pointed out before, are not allowed even to come near the place where the important ceremony is being performed. If a woman does come near, the poison will be completely spoiled, and if the woman has a sucking babe at home, the babe will die. The

poison cooks retire to the forest partly in order to be safe from the curiosity of the women.

The Indians believe that each of the plants used in preparing the arrow-poison is inhabited by a spirit or demon (súpai) to whom its poisonous properties are due. It is this demon that kills the victim when the poisoned arrow pierces his body. This is why the arrow-poison is also called súpai hámbi, 'the devil's medicine'. The spirit inhabiting the plants is influenced, as it were 'developed', compelled to concentrate its power, by the way the poison is prepared, and by the conjurations and incantations pronounced, just as, for instance, the spirit of the manioc plant is concentrated in the fermented manioc-beer. The poison cooks are thoroughly convinced of this fact, and the precautions they observe as well as the secrecy in which they veil their operations are due to this very belief. The spirit which is conjured and coerced is very angry and tries to harm its subduers. The poisonous gases which rise from the boiling pot are an expression of the anger of the tormented demon. The cooks therefore try to avoid, as far as possible, inhaling the harmful vapours which, they assert, make them ill. When they come home from the forest they are in fact pale and weak and behave as if they were more or less sick because they have had intercourse with the demons [152] of the poisons. It is probable, however, that their weak state is due more to the strict fasting than to the effects of the poisonous vapours.

As soon as the poison is ready, its efficacy is tested upon a frog, which is shot with a poisoned arrow. If the frog soon dies, this is a proof that the poison is strong, since frogs are tenacious of life.

Salt and sugar are antidotes against the poison or are, at any rate, regarded as antidotes. If an Indian has accidentally been wounded by a poisoned arrow, a small quantity of salt is dissolved in water and given him to drink. The Indians assert that in this case the harmful effects of the poison will fail to appear.

The same holds true of sugar. Real hunters among the Jibaros and Canelos Indians abstain entirely from chewing sugar cane and eating sweet things, because they believe that they will lose the power of catching animals and birds of the forest with poisoned arrows.

Only edible animals can be brought down with poisoned arrows. If some 'demoniacal' or otherwise useless animal, bird, or reptile--for instance a vulture of a snake--is shot with it, the poison will completely lose its efficacy and it will be impossible to bring down any game with it.

The poison works only when it enters the blood where it brings about an instant coagulation and a paralysis of the muscles, and the Indians realize that--just as happens with the venom of snakes--it spreads rapidly round the whole body through the circulation of the blood. If the poison does not penetrate into the blood it does not

cause death, at any rate not so quickly; it is even possible to swallow an insignificant quantity of it without risk, if only the person doing it has no wound in his mouth or in the intestines. When the Canelos Indian buys poison and wants to try whether it is active and strong, he takes a little of it on his tongue, to form an opinion as to its quality from its taste.(1)"

"1. The sample of the arrow-poison of the Canelos Indians which I brought to the Gothenburg museum has recently been physiologically examined by Professor C. G. Santesson in Stockholm. See his 'Pfeilgiftstudien. Eine Kurareprobe aus Ecuador' in Skandinavisches Archiv für Physiologie, 1934. Band LXVIII. --The great number of different plants used by the Canelos Indians in the preparation of the arrow-poison, of which at any rate the majority are poisonous, clearly stamps as erroneous the opinion held by many toxicologists, that the alcaloid existing in the Strychnos species is the only really effective ingredient in the arrow-poison. See my articles 'Notes on South American Arrow-poison' in Societas Scientiarum Fennica. Comment. Human. litt. VI. 4. 1933, and 'Addenda to my Notes on South America Arrow-poison' Ibid. Comment. Hum. Litt. VI. 7. 1934, the latter article being a reply to Santesson's article 'Bemerkung über südamerikanisches Pfeilgift', Ibid. VI. 5."

1: Karsten--153-155 (1916-18) 1935 Jivaro-1
116, 278 (1928-29)

"The Jibaros on the middle Pastaza and those living on the upper Morona also gave me some information about their arrow-poison.

The lianas and shrubs used by them are the following, which I give under their Jibaro names.

1. Yarrier, one of the biggest lianas of the virgin forest (probably identical with the tarapútu cara of the Canelos Indians). A certain quantity of the rind is scraped off with a knife and boiled in a pot with other poisonous ingredients.

2. Yariráhua; 3. Tsaueimera; 4. Papúra; 5. Nupáma; 6. Machápi; are all thick lianas of about the same size as the Yarrier just mentioned. They are all prepared in the same way, a quantity of the bark being scraped off and boiled with the poisonous ingredients obtained from the other plants.

7. Páingis is a smaller liana about 2 to 3 cm. in diameter. It is prepared in the same way as the other lianas.

8. Eimera is a small wild shrub. The Jibaros use the root of it, scraping off some of the rind which covers it, and then preparing it in the same way as the rinds obtained from other plants.

9. Yeistseása (seása = 'poison') is another small shrub with poisonous properties. A quantity of the rind is detached from the stem and beaten with stones. The juice is thus pressed out and then boiled.

10. Tachira is likewise a shrub. The rind is scraped from the stem and boiled with the rest of the poisons.

These are the ten plants used by the Jibaros of the Pastaza in preparing the arrow-poison. I have no doubt that some of them are identical with the lianas and shrubs used for the same purpose by the Canelos Indians, and one or more of them are probably Strychnos species. Still it is remarkable how differently composed the 'curare' poisons of these two neighbouring tribes are. The Canelos Indians mix a good many more vegetable ingredients in their arrow-poison than do the Achuares and on the whole seem to prepare it with greater care. However this may be, the poison of the Achuares also had the reputation of being strong and active, and the Canelos Indians not only bought blowguns from their savage neighbours but also appreciated their poison. It is evident that many of the plants used for the purpose by the Canelos Indians do not grow at all in the country of the Achuares, and vice versa. Even within a comparatively limited area, like Eastern Ecuador, the plant world varies to a certain extent, so it is natural that the arrow-poisons also vary. [154]

The method of preparation employed by the Achuares differs to a certain extent from that customary among the Canelos Indians; the latter always prepare the poison in the forest, but the cooking only takes one day. As the liquid gradually evaporates, the solid parts are removed, and the residue is boiled further on a slow fire until only a

small but concentrated and thick quantity is left. For the rest, many of the details are the same as we have just learned with reference to the Canelos Indians. The pot used for the cooking must be quite new and not previously used for any other purpose. The fuel used for the fire must be chonta wood. The cook prepares himself for the work by fasting for one day; he eats only a few plantains boiled in water and mashed, and takes tobacco water in repeated doses. He has also to observe sexual abstinence. The actual day that he stays in the forest cooking the poison he eats nothing at all. No woman is allowed to come near the shelter where the poison is cooked. If a woman comes there, she exposes herself to supernatural dangers and the poison will be entirely spoiled. The same would happen if the cook ate salt or sweet things, or if such things came into contact with the pot in which the poison is boiled.

The Jibaros have the same ideas as the Canelos Indians regarding the nature of the poisonous plants and the prepared poison: in each plant there is a spirit or soul (wakáni) which effects its growth and which, at the cooking of the poisons, is influenced and developed. The demon, being coerced and constrained by the conjurations of the medicine-man, is very angry and tries to revenge himself on his tormentor. This anger finds expression in the poisonous vapours rising from the pot. The fasting to which the cook submits, as well as certain other precautionary measures, aim at protecting him from the evil demon. Thus for instance, before he starts cooking, he

divides his hair into the three pigtails which are customary among the Jibaros and are believed to enhance a man's power of resisting evil spirits. For the same reason he paints himself red in the face with roucou, and stops his nostrils with cotton so as to avoid inhaling the noxious vapours. When the cook returns home in the evening he is still haunted by the demon, who sucks him on the shoulders the breast, and the back, and torments him at night with unpleasant dreams and hallucinations. Even on the following day, therefore, he is obliged to diet and to observe other rules of abstinence. He takes tobacco water repeatedly and eats only plantains boiled in water and mashed, just as on the previous two days. When he eats, he does not touch the plantains with his fingers, but avails [155] himself of a small wooden stick so as not to defile the food and expose himself to danger. He also avoids sleeping with his wife and passes the first night in the men's department, tangámasha.

When the poison is ready, its efficacy is tested on a tucan. A small boy is sent out into the forest and imitates the scream of a tucan wounded to death by an arrow. In this way, the Indians believe, the poison will be effective and strong enough to kill tucans and other birds of the forest."

"If the arrow-poison is kept for a long time and is exposed to humidity--which is always more or less the case in a tropical climate--it easily loses its original efficacy and may even become entirely useless. The Indians, however, know how to improve such poison by reboiling it and mixing with it certain new ingredients. Even those Jibaro Indians--for instance the tribes of the Upano--who do not prepare their arrow-poison themselves but buy it from other tribes, know how to make an old and useless poison efficacious again. Among the Jibaros of the Upano the following two ingredients are used for the purpose:--

1. Seása kunápi. Kunápi (in Quichua tzigta), a shrub of which there are various species. Some of them are only slightly poisonous and are used by the Indians as ordinary medicines. A certain quantity of the rind is scraped off and boiled in water, the decoction being taken as a remedy for catarrh, head-ache, and other ailments. The species which the Jibaros call seása kunápi is more poisonous than the others and is exclusively used for improving the arrow-poison. The rind of the shrub is boiled and the poisonous liquid extracted, just as is customary in regard to other plants used in the preparation of the poison. [156]

2. Ambi (in Quichua pucúna útchu), Indian pepper (Capsicum) of the particularly strong and poisonous variety which the Canelos Indians also use as an ingredient for the arrow-poison.

The old, dry arrow-poison is powdered or crushed into small pieces and boiled with the new ingredients in a small pot for a whole day, so that they form a chemical compound, which is then allowed to congeal and thicken. The poison cook has to fast and observe the same precautionary rules as when new arrow-poison is made. After the poison is ready it must stand for some days in order to get thicker and 'ripen', and during these days the cook has to continue observing certain precautionary rules. He does not leave the house, but remains in his bed (peáka) in the men's quarter warming his legs over the fire, just as the Jibaros are wont to do when they are in a state of ceremonial uncleanness. His food consists, as usual, of boiled and mashed green plantains, and when he eats he uses a small stick instead of his fingers. If he does not strictly fast and if he is not cautious in other respects, the new ingredients will not mix properly with the old ones and the poison will fail to improve."

1: Karsten--158-159 (1916-18) 1935 Jivaro
116, 231, 278 (1928-29)

"The Canelos Indians told me that domestic fowls and swine are immune to their arrow-poison. This statement has been confirmed by a physiological examination of the poison, although the immunity is [159] only relative. (1) The same is probably true of the arrow-poison of the Achuares."

"1. See Santesson, Pfeilgiftstudien, p. 213."

l: Karsten--159 (1916-18) 1935 Jivaro
116, 278, 784, 411 (1928-29)

"All Indians seem to observe the rule never to use poisoned arrows against snakes, vultures, and other similar animals, which are considered unfit for food and concerning which they have certain superstitious ideas. The arrow-poison in that case would lose its efficacy entirely. Similarly the idea seems common to all Indians, that the blowgun and poisoned arrows cannot be used in war. The arrow-poison with which a human enemy has been killed, it is believed, can no longer be used to kill an edible animal; in this respect the arrow-poison resembles lances and rifles. If an enemy has once been killed with such a weapon, it can no longer be used in hunting. A wild hog, for instance, if killed with such a lance or rifle, would have the same taste as human flesh and would not be eaten by anybody. The Jibaros therefore exchange the lances they have used in war as soon as possible. The Indians told me that in former times they used their blowguns and poisoned arrows in war, but the same rule was valid in regard to them as to the lances and guns, namely, that afterwards they could only be again used in war, never for killing game, since the same weapon cannot be used for both purposes."

"In studying the Indian blowgun in detail and the ideas connected with the arrow-poison, one is necessarily led to the question of how the Indians of tropical South America originally came to invent such a thing as the poisoned arrow and to use it in the way they do. An answer pre-[160]sents itself to any one able to enter into their theory of witch-craft and magic in general. In this respect there are three phenomena especially which greatly influence the imagination of the Indians: the first is the bite of the venomous snake, the second the mysterious magical arrow which the wizard lets off against his victim, causing his death, the third the poison he himself uses to bring down animals and birds. That to the Indian mind there is an intimate connection between these three phenomena becomes clear to everybody who is acquainted with the magical ideas or 'superstitions' of the Indians. Moreover, there can be no doubt as to which of the three was the primary link in the association series: it is the bite of the venomous snake. In all parts of tropical South America the venomous reptiles occupy the same important place in the native's world of demons; few others of the surrounding natural phenomena have stirred the imagination of the Indians in the same way as these. The venomous snake attacks its victim noiselessly, the wound inflicted by it is quite insignificant and yet causes death. In the whole action there is something mysterious or, to the mind of the Indian, supernatural. As a matter of fact, all Indian tribes in different parts of South America seem to have the same idea about poisonous snakes: with the venom of

the reptile an evil demon enters the body of the person bitten and causes his death. This demon is called súpai by the Quichua-speaking Indians, wakáni or iguánchi by the Jibaros. But they go still further in their theory: the súpai or wakáni in question is in reality nothing else than the soul of an evil wizard, perhaps still living, who temporarily takes the shape of the reptile in order to kill or harm an enemy. The bite of the snake was only the magical arrow of the sorcerer, the súpai or wakáni which killed the patient was really his demoniacal soul, identical with the poison permeating--according to the Indians--his whole organism. I found this belief among all the Indian tribes I studied, and I have no doubt that it is common to all tribes of tropical South America. These primitive ideas will be further elucidated in the part dealing with the religion of the Indians. In this connection I only wish to point out that there is also an interesting parallelism between the operation of the sorcerer and that of the Indian hunter who, with his 'natural' poisoned arrow, brings down the creatures of the wood. The Jibaros, for instance, call the poisoned arrow tsinsáka, and they give the same name to the mysterious invisible magical arrow used by the wizards, although there is also another name for it: tunchi. The magical arrow (tsinsáka) of the sorcerer, it is true, may assume different forms, but mostly it is sup-[161] posed to be like a small arrow. The wizard shoots his arrow from his mouth by blowing and a movement with his finger, just as the Indian, shooting with his blowgun, lets off his poisoned arrow by blowing it out.

In short, the venomous snake inflicting a deadly bite on his victim is nothing but an evil wizard operating through that snake, and vice versa, the Indian wizard, in his mysterious manipulations with the invisible magical arrow, is imitating a snake. On the other hand, the Indian hunter, who noiselessly lets off his poisoned arrow against an animal and kills it without inflicting any visible wound on it, is also a kind of wizard, since the poison with which he operates is believed to possess supernatural demoniacal effects.

The Indians, like primitive folk in general, are keen observers. It seems highly probable that precisely the mysterious way in which the venomous snakes operate, when by an insignificant bite they bring death to their victim, has suggested to their mind the idea that they may imitate them and invent a weapon which will act in the same way as the snake's poison. The thorough knowledge they possessed of the poisonous properties of certain plants helped them in their endeavours to construct that weapon, and it is evident that the arrow-poison is meant as an imitation of the venom of the snake. It is significant that according to the statement of the English traveller Waterton --the first, I believe, who studied the ourali poison of the Guiana Indians--the Macusis in preparing their arrow-poison not only used vegetable ingredients like the Strychnos toxifera, but also certain animal ingredients, namely, the fangs of the counacouchi and

labarri snakes, two of the most venomous snakes of tropical South America, which were pounded and mixed into the poison. When the Macusi Indian killed one of these snakes, he always extracted the fangs for use in the preparation of the arrow-poison. (1) This of course was pure superstition, but the association of ideas is interesting and shows what part superstitious ideas in general, and especially those prevailing in regard to venomous snakes, has played in the invention of the Indian arrow-poison."

"1. Cf. Waterton, Wanderings in South America, London, 1828, pp. 55 sqq."

1: Karsten--177-178 (1916-18) 1935 Jivaro-1
116, 226, 278 (1928-29)

"The last and most interesting method used by the Indians in fishing is by poisoning the water in the river. The poison most commonly used for this purpose is the one known under its Spanish name barbasco, a name also used by the Quichua-speaking Indians in Eastern Ecuador. [178] Under this name, however, various poisonous plants are comprehended. The plant most commonly used is probably Cracca toxicaria, which is cultivated both by the savage Jibaros and the Canelos Indians. The same plant, as we have seen, is used at the preparation of the arrow-poison. The root of the bush is the part used. Several roots are first crushed with a club in a hole made for the purpose in the ground, to free the poisonous juice they contain. Then they are put into one or several baskets woven of forest vines, of the kind used by all Indians.

There is also a wild varvasco plant which has the form of a vine. For the purpose of extracting the poison the vine itself is crushed and the juice is pressed out, just as is done with the roots of the cultivated barbasco plant. The scientific name of this vine is unknown.

The savage Jibaros, however, have two fish poisons more, of which the one is called massu (probably Paulinia or Sejania species, of the family Sapindaceae). The leaves and the stem of this plant are the parts used; they are crushed with clubs in a hole in the ground, the mass is soaked in some water and the poisonous liquid used in the same way as the ordinary varvasco poison. The other fish poison is by the Jibaros called

payashi (Paulinia pinnata?), of which the root is used in the same way as the root of the varvasco."

1: Karsten--233 (1916-18) 1935 Jivaro
278 (1928-29)

"Poisonous drugs are not used for the purpose by the Jibaros, but this, on the other hand, seems to be the case among the CANELOS INDIANS. They prepare a medicine by crushing and boiling the stem of a vine called shigshi huasca, or the rind of a shrub called petun cara, and give this decoction to drink to a woman who wishes to rid herself of the consequences of sexual relations outside marriage."

"The pharmacological knowledge of the Indians is wonderful. I have had an opportunity to point out this with particular reference to their arrow-poison, but it is equally conspicuous in regard to their medical art in which plants play a dominant part. A whole book could be written about the Indian plant medicines, but unfortunately of this subject the same must be said as I have stated of the plants from which the arrow-poison is prepared: the material necessary for treating this subject can properly be collected only by a botanist. European medical science owes several useful plants to the Indians of South America, but those hitherto known only form a fractional part of those actually existing. I therefore wish to emphasize once more the importance of this particular subject being studied by experts in pharmacology and botany. Expeditions sent out for this purpose to the upper Amazonas regions are almost sure to achieve results of great value.

Of the numerous plant medicines of the Jibaros and the Canelos Indians several have already been mentioned by me in previous chapters. I beg only to draw attention for instance to the various medicines which, in the latter tribe, both the father and mother of a newborn child have to take, partly to purify themselves, partly to fortify and strengthen the babe. To avoid repeating statements made before, I shall only mention a few other medicines which are commonly used and which throw some light upon the medical art of the Indians. I remark that these medicines, most of which are obtained

from the plant world, are a commune bonum to all Indians tribes on the upper Amazon river. The names of [507]the plants are given partly in the Jibaro language, partly in Quichua. For some plants or medicines the Canelos Indians use Spanish names.

Several plant medicines are used as remedies against fevers. One of these is the aya huasca (natéma), which we already know as an important narcotic producing visions and hallucinations. Beside this, the Canelos Indians assert that the medicine is an efficacious remedy for malarial fever, especially when mixed with a little tobacco water, and this assertion is confirmed by the white settlers in Eastern Ecuador who frequently use it in such cases.

Another remedy for fever is prepared from a Verbena species, called yapáu by the Jibaros. The leaves of the plant are boiled in water and the decoction taken as a medicine. Exactly in the same way the Indians use another plant, a Cyathula species of the family Amaranthaceae.(1) Sometimes decoctions of both plants are mixed, by which the efficacy of the medicine is enhanced. It is also said to be a remedy against tape-worm. The Cyathula species is by the Canelos Indians called iskantsēli, by the

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"1. I am obliged to Dr. H. Lindberg in Helsingfors for the botanical determination of the Verbena and the Cyanthula species."

Jibaros kántsea. The latter Indians, when using the kántsea-leaves, are also in the habit of mixing the decoction with the white of one or two eggs beaten up as well as with some mountain salt (catchi).

Quinine bark, cascarilla, which is to be obtained in the forests of Eastern Ecuador, is used by the Canelos Indians as another remedy for malaria. An extract is made of some pieces of bark, which is mixed with brandy. Both the Indians and the settlers assert that taken together with brandy the cascarilla extract is much more efficacious.

The cinnamon bark and the cinnamon flower (ishpingu) is at Canelos used as a remedy for diarrhoea and pains in the stomach. A decoction is made of some pieces of the bark or some flowers and the medicine is drunk.

The shrub called tzigta in Quichua has been mentioned as a plant which yields one of the poisonous ingredients by which an old and useless arrow-poison is made efficacious again (p. 155). Of this plant, which I have not been able to identify botanically, there seems however to exist various species of which some are only slightly poisonous and used as ordinary medicines. A quantity of the rind is scraped off and boiled in water, and the decoction is taken by the Canelos Indians as a remedy, especially for catarrh and head-ache. It is in fact one of the medicines most commonly used by them.

Another medical plant of the same Indians is the one called pata-[508] cunyúyu. The

leaves of the plant are boiled in water and the decoction, mixed with some salt, is taken as a vomitory.

The small plant called yerba Luisa is used both by the white settlers and the Canelos Indians as a remedy for chills. A decoction is made of the leaves for the purpose and taken by the patient as hot as possible. The medicine is also good for pains in the stomach, especially mixed with some soda.

Ambára is the name of a small plant which is used by the Jibaros for the cure of dysentery. The roots are boiled for the purpose for a long while and the decoction taken as a medicine which has purging effects. It also acts as a vomitory.

Jaundice is cured by the Jibaros by a medicine prepared from the bark of the cedar (Cedrela herrerae). One part of the bark in two parts of water is boiled for one hour. A quantity of this decoction, about one drinking glass, is taken every morning on an empty stomach and will in a few days cure the patient.

Emetics in general play an important role in the medical art of the Indians, as appeared from descriptions of ceremonies performed at feasts, etc. Thus the aya huasca, the guayusa solution, and the medicine prepared from the root chiki at the feasts of the women, all have the effect of vomitories by which the organism is purified from harmful substances. An important emetic of the Jibaros is their own native salt (whui), which is never used as a spice but appreciated all the more as a medicine. These

Indians make a distinction between the salt which they prepare themselves by boiling, and the salt which they obtain in the way of barter from the Canelos Indians and which is called by its Quichua name catchi. This salt too is used exclusively for certain medical purposes, but not as an emetic.

Just as the Indians appreciate emetics, they appreciate medicines with purging effects. Such a medicine is for instance the ambára, mentioned above, by which the Indians cure dysentery. Other strong medicines of this kind are used as a cure for tape-worms.

The stomach and intestinal canal of small children is purified by means of a decoction of ferns, which is taken as an ordinary medicine. In other cases the Indians prepare a clyster for the same purpose. A clyster which came under my notice among the Jibaros consisted of a decoction of four different plants all of which are cultivated by the Indians: the first was the plant kántsea, mentioned before; the second the leaves of a plant called mapash; the third a kind of grass called chiri-[509]chiri; and the fourth a small plant called púyu. This strong medicine was injected into the rectum of the child by means of an enema-syringe consisting of a hen's bladder attached to a piece of the stem of the sanahoria plant (Daucus) which is hollow. Syringes of this kind are commonly used by the Indians. Dysentery and diarrhoea in children are generally cured in this way.

Grown-up people are in some cases cured by another kind of clyster consisting simply

of a solution of Indian pepper (Capsicum). By such a clyster the Indians for instance try to cure patients from the consequences of snake's bite (p. 420). The Indians of the Pastaza have recourse to this remedy especially against the scurvy (escorbuto) which at times makes it [sic] appearance in that unhealthy region, assuming an epidemical character. The Indians of Canelos do not use a clyster in the proper sense of the word, but mix certain strong ingredients, gun powder, Indian pepper, mashed pieces of the ginger root, and the root of a third strong plant called botoncillo in Spanish. A piece of cotton-wool is soaked in these strong medicines and introduced into the anus of the patient for a short while; he could not stand it for long. According to the idea of the Indians, this disease is due to the anus of the patient being attacked by certain worms which will rise higher and higher along the intestinal canal and rapidly cause the patient to rot away. If the remedy is applied at once, the worms will be killed by the strong medicines and the patient may be saved. I heard of several cases on the Pastaza when Indians and white settlers had been cured in this way from ths [sic] terrible malady, which generally leads to death in two or three days. --That a clyster consisting of a solution of Indian pepper really has disinfecting and purifying effects, is beyond doubt.

There are also, of course, plant medicines which are believed to have the effect of healing wounds. Of this kind is for instance the resin or balsam called copaiba and obtained from the Copaifera tree. The wound is washed clean and the balsam is

dropped on it. The copaiba is also used as a remedy for the gonorrhea."

2: Stirling --84 (1930-1931) 1938 Jivaro
116, 278

"Poison is necessary to make the darts effective, except when shooting small birds. At the present time many of the Jivaros buy their poison from white traders or from neighboring tribes. This poison is mostly made at Llamas and Taratotos on the Huallaga River in Peru. The Jivaros occasionally make poison of their own which is probably the type used when they first secured the blowgun. The Jivaro names of the ingredients as used on the Yaupe are as follows: Machápi, described as being a vine; Aimár, a root; Tságuami, the bark of a tree; Cacátza, a vine; Puíngish, the leaves of a bush; Ambi, a small pepper. (20) These are mashed together by pounding them with a stone in equal proportions. This mash is then mixed with water and boiled for about half an hour. Then the liquid is filtered through a piece of cloth, usually a piece of worn-out itipi. The filtrate is allowed to stand until it forms a black, pitch-like substance. This is again heated in a small pot and put into bamboo tubes or tiny earthenware pots (pl. 36, c).

Before putting it on the darts it is heated in order to thin it. It is smeared on the points of the darts with a spatulate piece of wood. Then to dry them so that the poison will adhere better the darts are planted in the earth around the fire, points up; after which they are placed in the quiver and are ready for use."

"20. Karsten gives a list of 30 ingredients used inmaking poison on the Upano."

"When Up de Graff was dealing with the Indians of the Santiago he learned how to manufacture dart poison from the Indians below the Pongo, and made it himself in quantities in order to trade it to the Antipas Jivaros. He describes the process as follows:

> The vine from which it is made grows in great profusion throughout the upper Amazon zone, and the process is simple in the extreme. It is cut into sections a foot in length, and the thin hard outer crust of bark is carefully removed by scraping. The main bark, white when first exposed to the air, turns brown in just the same way as an apple. This inner bark is scraped into fine shavings by means of shells and flints, and these are placed in a colander which rests upon a pot in which water is boiling. The water is poured over the contents of the colander repeatedly, until the constant action of it has drawn out the alkaloid, when the lifeless shavings are thrown away and the residue is boiled down until it resembles plain chocolate in consistency, color, and smell. While still warm it is poured into a bamboo receptacle and when cool it becomes semisolidified.(21)

[6]Up de Graff mentions that when the Jivaros manufactured their own poison the process was involved in considerable superstition and ritual. Only the wishinu might make it. He must also make the small pots in which it is kept. In addition to the use of the vine

"21. Up de Graff. p. 213."

as described by Up de Graff, numerous other ingredients are employed, such as spiders, ants, and vegetable extracts supposed to contain tsarutama. Up de Graff gave it as his opinion that the addition of these other materials served only to dilute the poison, as the Indians found his poison to be more effective than their own. It is probable that the 'Machapi' vine mentioned by the informants on the Yaupe as the first item in making poison, is the same vine as that used by Up de Graff, and it is probably the only active ingredient in the mixture."

2: Stirling--85 [2] (1930-1931) 1938 Jivaro
116, 278

"When poison in storage dries up and becomes hard it is unfit for use. However, there is a process for renewing it. This is done by putting lemon juice in the poison pot and heating it over the ifre, meanwhile stirring with a stick until it becomes plastic again. About 24 hours are required to complete this process. Poison may only be renewed once in this fashion, as to do so more frequently causes it to lose its effectiveness.

According to the Indians, the length of time required for the poison to take effect varies with respect to the location of the wound, the species and size of the animal, freshness of the poison, and similar factors. Large birds usually resist the poison from 10 to 15 minutes. The writer has seen large monkeys, wounded with several darts, live for almost half an hour."

2: Stirling--104
116, 226, 278, 461

(1930-1931) 1938

Jivaro

"The aboriginal methods of fishing appear to be poisoning, trapping, and spearing. Fish traps as a rule are constructed during high water in overflow areas where streams are about to subside, or along small swollen streams up which fish have ascended from the main rivers. For poisoning fish a dam is generally constructed along a small stream during low water. Barbasco shrub is gathered in sufficient quantities, macerated by means of pounding it between large stones, and then thrown into the water, being careful to distribute it evenly at a point 30 or 40 yards above the fish dam. The juice of the plant spreading through the water stupefies the fish, which rise to the surface in a more or less helpless condition, where they are gathered up by the Indians. On these fish-poisoning occasions generally a large part of the community participate; men, women, and children taking part and make of it an enjoyable social affair."

4: Up de Graff--209-210 (1897) 1923 Jivaro
116, 226, 278

"Anxious to see how the Antipas supplied themselves with fish, I once went with them (men and women) for a day's sport to a small stream a couple of miles from the settlement. While making our way along the trail, the women cut down barbasco wood (the Inca name for a vine whose sap is a deadly poison) and packed it along with them. Arrived at the water's edge, we looked for a suitable pool, exercising great care not to scare the fish away. The party divided into two sections, and each formed a barrier at one end of the pool. The men proceeded to pound the barbasco between heavy stones and throw it into the pool, where it floated about without having any apparent effect on the water. Within a minute or two the fish began floating to the surface, upside down, and swam about aimlessly in a dazed condition, easy prey for the savages who waited about (swimming and diving themselves when necessary) collecting them. We caught in half an hour at least a hundred pound weight.

This is the only method of catching fish they know, [210] except netting. Their nets are made of palm-fibre, and in place of corks and leads they use balsa wood (Spanish) and stones. The net is fixed across a rivulet, and the party makes its way by a detour to a point up-stream. There they throw stones into the water and frighten the fish into a hurried flight to where the trap awaits them. The meshes of the nets are so proportioned as to catch the fish by the gills as they rush down-stream."

4: Up de Graff--213-214 (1897) 1923 Jivaro-1
116, 224, 278

"The big monkeys are the hardest game to bring down with shot-gun or rifle. I have shot them to pieces with a Winchester, until their entrails actually fell to the ground, before they have fallen. Even when dead, very frequently they remain suspended by the tail, and the tree has to be climbed before they can be recovered. But the poisoned dart from a blow-gun, as long as the skin is broken at any point, kills them within two minutes. Experiments which I have carried out on domestic animals have proved, moreover, that the poison (of which I brought home a small quantity) acts painlessly, the effect being much the same as an overdose of morphine. This fact leads me to believe that a drug could be manufactured from the same vegetable which would be invaluable in medicine. A trial was once made in the Guianas by an English naturalist with the same drug (under the local Indian name of huareli) on a bullock, which died in twenty minutes as a result of three arrow wounds. The vine from which it is made grows in great profusion throughout the Upper Amazon zone, and the process is simple in the extreme. It is cut into sections a foot in length, and the thin hard outer crust of bark is carefully removed by [214] scraping. The main bark, white when first exposed to the air, turns brown in just the same way as an apple. This inner bark is scraped into fine shavings by means of shells and flints, and these are placed in a colander which rests upon a pot in which water is boiling. The water is poured over the contents of the colander repeatedly, until the constant action on it has drawn out the alkaloid, when the lifeless shavings are thrown away and the residue is boiled down until it resembles, both in

consistency, colour, and smell,plain chocolate. While still warm, it is poured into the bamboo receptacle previously described and when cool, it becomes semi-solidified.

Of course there is a great deal of superstition among the Jívaros in connection with the manufacture of this poison. The medicine man alone can make the pots which are used to boil it, and he is furthermore the only person who is privileged to make the poison itself. He collects the stings from various species of noxious insects. Spiders' teeth are also greatly favoured; both these ingredients are introduced into the pot with due ceremony and unlimited confidence in their deadliness. If water can be obtained from the spot where a rainbow touches the earth, then indeed the brew will be immeasurably potent! But be that as it may, the poison which we bartered to the Antipas had not been tempered with any strange charm, as we who made it know, and yet it is declared by them to be the best they had ever used.

There is really a certain amount of risk and danger connected with its manufacture, insomuch as the fumes given off by the boiling liquid are pungent and noxious. I believe that they would prove fatal if inhaled in sufficient quantities; which supposition lends credence to the stories of the Indians that many a medicine man has been found dead over the pot."

4: Up de Graff--215 (1897) 1923 Jivaro
116, 278, 721

"Despite its proved deadliness, this poison is never used by the head-hunters in warfare. (I say 'deadliness' with some justification, for it compares very favorably with, say, the poisonous snakes of India, whose bites take more hours to bring on death than the jambi does minutes.) Why, I cannot explain, unless it be that a man can snatch an arrow from a wound so quickly that the poison would never have time to be absorbed by his system, as it clings to the arrow-head in a gelatinous form. While speaking of this poison and its effect on men, I recall an incident that happened on the Yasuní when Jack Rouse and I were existing through those ghastly eighteen months. An open wound that had become fly-blown and full of worms (there was nothing in the nature of a fresh cut about it) had to be cured somehow, and every remedy we could think of had failed. The case was one of desperate urgency, and Jack declared that 'he would rather be poisoned than eaten alive by worms.' So it was decided that I should fill the wound with this same jambi, and I applied about a thimbleful, or enough to kill an ox. Neither Jack nor the worms took the slightest notice. Now it may be that his life was saved by the fact that there was no fresh blood flowing, or again that the poison, for some strange reason, has no effect on men, which latter supposition would account for its never being used in battle. I may add that the worms were summarily ejected in the space of half a minute by the application of a wad of cotton soaked in nicotine procured by condensing cigarette smoke on the finger-nails. (The juice of the same cigarettes when boiled has no value whatever)."

4: Up de Graff--216 (1897) 1923 Jivaro
116, 762, 278

"It is this same barbasco juice [KS: poison used for fishing] which the Jívaro women drink to commit suicide."

5: Reyes and Teran--98 (No date) 1939 Jivaro
278

"The natema, climbing vine of the passifloraceous family, is a powerful narcotic. An infusion from its stem frequently is used by the Jivaro to treat sickness or to obtain prophetic dreams."

The poison looks like an almost liquid black paste. It is not made by the Jibaros, who acquire it by exchange from the Ticunas, Yaguas or Orejones Indians of the Amazon (1). Depending on its origin, the poison is called ticuna, yagua or orejon. The first costs too much, so generally the last two are used. The savage prepares it specially in order to increase its potency. To this end, he searches for a nest of very venomous ants which he calls isula and places nearby his little pot of poison, being careful to connect its edge and the ground with little sticks. The ants go up along the latter and the Indian makes them fall into the pot with a long rod from a distance. When the collection is sufficient, he adds a little water to the poison, closes the vessel and over [597] a slow fire, cooks and reduces the mixture until the insects are in some measure dissolved.

These poisons do not generally have an action as rapid as certain people say, and in any case their effects vary greatly according to the kind of animal. The dog and the gallinazo (Cathartes sp.) [JP: turkey buzzard] are immune to it; the toucan and the hen resist more than a quarter of an hour; the pava (Penelope cristata), the pheasant and other birds survive ten minutes. Other animals succumb more rapidly. The roe buck in spite of his size is very sensitive to it; one Ecuadorian explorer told me of having

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1. See the subject of Amazonian poisons: Olivier Ordinaire. Du Pacifique à l'Atlantique par les Andes péruviennes et l'Amazone. Paris, 1892, page 267.

seen a buck wounded in the nose to fall dead two hundred meters farther. The effect on man is almost nil. The wounded Jíbaros heal themselves by sucking a piece of sugar cane.

34:Harner E-4, 5 (1956-1969)1973 SD9 Jivaro SD9

411
223
224
[278]

Stalking is the chief hunting technique, both for arboreal and ground-dwelling creatures. Monkeys and large birds are usually stalked with the blowgun (see Plate 8) and darts poisoned with curare (unpoisoned darts suffice for small birds). A poisoned dart is notched around its tip so that it will break off if a monkey tries to remove it. The hunter, usually alone, but sometimes with a male companion, waits until the monkeys are calling among themselves before stepping stealthily to the base of the monkeys' tree and blowing. The maximum effective range of the blowgun rarely exceeds 100 feet, but the silence of the weapon often permits the hunter to shoot several individuals before the troop becomes alarmed and swings off through the trees. The shot monkeys drop from the trees within a few minutes. The blowgun is not considered satisfactory for hunting ground-dwelling creatures, which are killed instead with shotguns and old Winchester .44 carbines, loaded either with shot or, rarely, in the case of the latter weapon, with bullets. Shy birds, such as the toucan, are hunted more with firearms than with the shorter-range blowgun.

411
[438]
[278]

The blowguns and curare dart poison are obtained almost entirely by trade from the Achuara, the Jívaro acknowledging themselves to be inferior blowgun makers and stating that they do not possess the right plants in their region to produce first-rate poison. The blowguns themselves are about seven feet long and made of a single piece of chonta palm which has been split down its length into two pieces which are grooved with great precision and bound together with fiber strips cemented into place with a black beeswax coating.

[224]

Blowgun darts are easily made, in a fraction of a minute, by whittling the slender ribs of ivory nut palm leaves. In hunting, the darts are carried in a quiver around the neck or

34:Harner E-4. 5 (1956-1969)1973 SD9 Jivaro SD9

sized fish are also caught in deeper waters with a special thin, long palm wood thrusting spear.

Fish poisoning is undertaken perhaps every few weeks to secure a large catch. Men, women, and children from several neighboring houses usually participate. They select a section of river where it is bisected by an island or sandbar, to which the men and boys construct a low dam of river boulders from one bank. This stone dam is constructed to form a lagoon where the poison can sufficiently take effect in the slowed current. Other men meanwhile build split bamboo grating-like fish traps at several low points on the dam and prepare the fish poison.

Three types of plant piscicides are used: *timu* (in Spanish, *barbasco*), *masu*, and *payal*. *Timu* is considered the best of these, but is used in combination with *masu* for maximum success. Large quantities are required, and the fishermen often prepare six to eight bushel-sized baskets. They pound the plants to a pulp between river boulders and dump them into the water upstream. If all goes well, within twenty to thirty minutes stunned fish begin rising to the surface and float toward the dam. The men who constructed the traps seize the fish as they are washed onto the bamboo gratings. Everyone else, regardless of age or sex, wades into the lagoon and grabs for fish. Each person owns whatever he catches, although he often may give some of his catch to a less fortunate participant. Fish poisoning is sometimes pursued at night because the fish tend to be nearer the surface and therefore more susceptible to the poison. Both poisoning and netting are most effectively conducted during dry periods, when the rivers and streams are low and the current slow.

Gathering activities contribute quantitatively relatively little to the diet, approximately 5 per cent annually, but do provide a variety of delicacies to supplement it. Various species

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stone to crush maize for chick feed. The wooden planting and digging sticks used in agricultural work have been mentioned previously.

Vessels are made by the women from clay and gourds. All pottery is manufactured by the method of coil construction and vessels are finished by scraping. Three kinds of clay are used for different types of vessels. Carbonized bark of the *apáčaram* tree is powdered for tempering material in food bowls, while sand temper is used in drinking bowls, fermentation jars, and cooking jars. All vessels except cooking jars are coated with red achiote or black beeswax after firing. Only the interiors of large drinking bowls, the exteriors of miniature drinking bowls, and the interior necks of fermentation jars are ever decorated. Even then, such decoration is usually simple and hastily made, often consisting of unelaborated irregular zigzag and dot patterns in vegetal paint. The one apparent exception is the miniature drinking bowls, which sometimes have intricate and well-executed designs. These, however, are obtained by trade from the Canelos tribe to the north.

The fermentation jars are the largest vessels made, averaging about ten to thirteen gallons in capacity. These jars, covered with a drinking bowl or banana leaf, serve to store the fermenting manioc or chonta palm fruit beer. Next in size are the cooking jars, the largest of which are employed to boil the hallucinogenic *Banisteriopsis* for resident or visiting shamans. The other chief ceramic vessels are food-serving bowls and the two sizes of drinking bowls. Small pottery or gourd jars serve to store the curare blowgun dart poison. One special miniature pottery bowl is used by old men to brew an emetic tea from *Ilex* sp. leaves.

Large long-handled gourds hold water for cooking and

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that they are not on a hostile mission of stealth. Upon arriving at the house, the visiting enemy is offered beer and food, in keeping with Jívaro etiquette. The host is also honor-bound not to attack anyone visiting him peaceably, at least while the visitor is in the house and its environs. However, secret poisoning of proffered beer is assumed to be common, and the enemy may decline to drink, even though the woman serving it dips her hand into the bowl and sucks it to show that the beer is safe, a standard demonstration in serving all visitors. It is more likely, though, that he will accept the beer to demonstrate his confidence in his own invulnerability.

To avoid having the women or anyone else other than the *kakaram* learn the identity of the intended victim, the visitor pulls his stool close to that of the host and converses in whispers. In his conversation, the visitor acknowledges that he is an enemy of the host, and justifies his request not on the basis of any personal weakness or inadequacy, but because of the need for additional manpower in the expedition. If the *kakaram* has no reservations about killing the particular person discussed, he will almost always accept the invitation to kill. Partially this is due to general factors such as his desire to accumulate *arutam* soul power through killing and to further his prestige, but in this particular kind of situation, his acceptance is also due to his reluctance to lose face with his enemy. A refusal to participate probably would be interpreted as weakness or fear, unless he could give an acceptable excuse in terms of a kinship or friendship bond with the intended victim.

The Jívaro recognize that one of the major motivations for asking a *kakaram* who is an enemy for killing assistance is the hope to shoot him in the back while on the trail. Therefore, if he agrees to participate in a killing expedition with his enemy, he takes the precaution of bringing along at

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killed many times, so will you." Without another word the old man disappears and immediately the *arutam* soul of this unknown ancestor enters the body of the dreamer, where it is lodged in his chest.

Upon acquiring this *arutam* soul, the person feels a sudden power surge into his body, accompanied by a new self-confidence. The *arutam* soul is supposed to increase a person's power in the most general sense. This power, called *kakarma*, is believed to increase one's intelligence as well as simple physical strength, and also to make it difficult for the soul possessor to lie or commit other dishonorable acts. His newly acquired power increases his resistance to contagious disease to some degree, but most important, it makes it impossible for him to die as a result of any physical violence or sorcery. Most of his relatives and acquaintances shortly know that he has acquired an *arutam* soul simply because of the change in his personality. For example, he especially tends to speak with great forcefulness.[5] However, he must not tell anyone that he has acquired such a soul, or it will desert him.

When one has thus obtained an *arutam* soul, he generally is seized with a tremendous desire to kill, and it is ordinarily only a matter of a few months before he joins a killing expedition. If he is a young boy, he will accompany his father. The rare women who possess *arutam* souls kill primarily by means of poisoning food or manioc beer.

Jívaro killing expeditions usually attack the victim's house just before dawn. Late in the afternoon of the day prior to the attack, the expedition halts in the forest about a quarter of a mile from its intended objective. There, in their concealed location, the participants must "declare" what kind of *arutam* they had each seen. The younger men form a circle around several of the most experienced killers, who then ask

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bewitchers. With the guilt determined through divination with the aid of a hallucinogenic drug, and the subsequent vengeance probably wreaked on the wrong person (even if one believes in witchcraft deaths), it is clear that the shamanistic beliefs and practices have repercussions which heighten the sense of outrage and injustice that permeates the society and sets household against household. Under these circumstances, Jívaro witchcraft clearly promotes rather than decreases physical violence.

Although not believed by the Jívaro to be quite as pervasive an activity as bewitching, assumed poisoning in beer or in food likewise engenders retaliatory action through physical violence, even though, as in the case of witchcraft, the person believed to be guilty is, more likely than not, probably innocent. Under these conditions, then, the relatively clear-cut and consensually approved rules concerning offenses and sanctions regarding human life, sexual relationships, inheritance of women, and other less emphasized areas of dispute, have only limited utility in promoting social harmony and tranquillity.

Since there is no formal political or kin organization, the Jívaro apply sanctions against alleged violators of the norms purely by means of informal partisan action. The aggrieved party, together with those relatives willing to support him, takes upon himself the responsibility of punishing the person or persons he believes to be guilty of an offense against him or a close member of his family.

The determination of guilt in a specific case and of the proper sanction for a specific offense is a rather individualistic matter, with a significant degree of variability existing in case histories of even a single type of offense. The emphasis in the present description will be on the general pattern of offenses and sanctions, rather than on deviations from the norms.

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628 a shotgun to the aggrieved party as a compensation to terminate the matter. If the aggrieved party, primarily considered to be the eldest male of the murdered man's conjugal family, accepts this gift, then the gift-receiver takes the responsibility for seeing that his kinsmen consider that the matter is finished. He warns the other relatives of the dead man that if they attempt to kill the gift-giver for the old offense, they will have to fight him (the gift-receiver) as well.

628 While sanctions against murder by physical violence are, in return, expected to be by physical violence, punitive assassination of one who has murdered through bewitching may be either by means of sorcery or physical violence. Normally, the sanction for a first murder offense by means of sorcery is also assassination by sorcery. For a second homicidal sorcery offense, physical violence is considered to be the more proper sanction.

682 The importance of the concept of equivalent retaliation is indicated by the sanction considered proper when a man is poisoned by a woman. Poisoning (one of the favorite forms of murder) is done almost exclusively by women, since they alone prepare and serve the food and beer to guests. When a man is fatally poisoned, the aggrieved family may not attempt to kill the guilty woman, if they feel that the death of a woman would be inadequate to compensate for the death of a man. In such a case, they assume that the proper sanction is to poison the guilty woman's brother. Often, however, the vengeance is wreaked directly on the woman believed responsible. They usually have to wait several years in order to catch the victim off guard at a feast in order to poison him or her successfully.

754 In both poisoning and sorcery, there is the problem of properly identifying the guilty party. Most poisoning is done at the large *tsantsa* victory feasts, where a dozen or more

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women of different households are continually circulating among the guests serving manioc beer. The poisoner, under such circumstances, is very difficult to detect. The family of the victim, however, invariably accepts the opinion of the dying victim as to the identity of the guilty party, and her brother is marked for death.

A curing shaman who has attempted unsuccessfully to cure a fatal case of sorcery is expected to tell the deceased's survivors the identity of the bewitching shaman. Sometimes the shaman does so, but at least as often he simply says that the fatal magical dart came from a shaman "far away" whom he cannot recognize. In this way, informants say, the shaman avoids the reprisals which might result against himself if he were to name a specific Jívaro as the guilty party.

It is not believed proper to assassinate personally a brother or trading partner in retaliation even for the murder of one's wife or child, although cases do occur. The more common approach to administering the punishment is for the aggrieved party to plan and organize the avenging raid without actually participating. In such a situation, a non-related or distantly related *kakaram* may be invited to come and carry out the assassination.

Murder by witchcraft requires the sanction of homicide by physical violence, but most non-fatal illnesses ascribed to witchcraft do not usually evoke retaliation. One reason is that normally a curing shaman does not reveal the identity of the bewitcher except in fatal cases. When retaliation is desired for non-fatal witchcraft illnesses, the recovered patient hires a bewitching shaman to bewitch the original bewitcher.

Sexual offenses, with the exception of wife-stealing, normally do not involve the sanction of homicide. The punishment varies in specific instances, but most commonly consists of slashing the forehead and scalp of the offender with a ma-

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684 she does not thus invite him to return, however, he remains
593 separated.

If a man repeatedly commits adultery, his wife has the
586 right to poison him. Of course, the brothers and other close
837 relatives of the man will attempt to murder her in retaliation.
[278] Poisoning is also the sanction against a woman who deserts her husband. Desertion of a wife by a man is virtually unheard of, except when she is implacably hostile towards him, in which case it is proper for him to leave.

684 Incest is a sexual offense that merits different degrees of
835 punishment depending upon the degree of relationship. Sex-
605 ual intercourse with any known relative other than a cross-
582 cousin (*tsabe*), or a more distant relative also classified as a *tsabe*, is considered to be some degree of incest. If such a pair marries, they lose the respect of the neighborhood, and are called jokingly, *aka* (a species of worm) because, as one informant said, "worms enter wherever they like." The couple will be told, "We don't want *aka* to multiply here. Go to live far away." Although the couple is embarrassed, they ordinarily remain in the same neighborhood.

684 Deemed far more serious are cases of incest within the
593 conjugal family, i.e., between parents and their children or
835 between siblings. If a man is found to have had intercourse
[605] with his daughter, one of the girl's *tsabe* (male cross-cousin
[586] and potential mate) has the right to beat him with his fists. Then the father usually leaves the neighborhood and also his wife separates from him. If a man has intercourse with his own sister, a brother has the right to slash his head, and to tell him to leave the neighborhood. If there is no brother, it is
[605] the duty of the father. If the father is not living, a male cross-cousin has the right to beat, but not to slash, the offender.

684 Clearly defined norms exist regarding the inheritance of

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from the frontier Jívaro. These firearms are still being obtained in ever greater numbers.

The development of long-distance chains of trading partners between the interior Jívaro and adjacent tribes is an especially noteworthy change, mainly occurring since the end of the Amazon rubber boom, about 1914–15. The impetus for this development was provided by the fact that the end of the rubber boom found the Achuara tribe, which had been much more involved in the rubber trade than the Jívaro, suddenly cut off from their supply of firearms and ammunition. At the same time, trade between the frontier Jívaro and the whites at Macas and Méndez was beginning to develop significantly, and the Jívaro also wanted Achuara products, particularly blowguns and dart poison. The essential result was that both the Jívaro and the Achuara found it profitable to develop mutual trade. To the former inventory of products traded within the Jívaro tribe, such as salt and machete blade fragments, were added new goods coming from the frontier Jívaro on the west, and the Achuara in the east. The new goods primarily have been firearms, gunpowder, increased quantities of steel cutting tools from the frontier Jívaro, and featherwork, blowguns, and dart poison from the Achuara.

In connection with trading partnerships, a minor ritual has been learned from the Achuara tribe. This is the ceremony in which two men embrace each other, kneeling on a cloth, to formalize a partnership relationship. Previously any contractual ritual was unknown.

The now universal demand among the interior Jívaro for firearms and gunpowder has made the men of every neighborhood extremely dependent on those persons who have trading partners in neighborhoods nearer the regions of white settlement in the west. The intensification of the trading

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digging of foxholes in house floors is a related new development. The construction of double walls behind beds has become common to protect sleepers from assassins attempting to shoot between the palm staves of the house wall at night. The construction of escape tunnels has declined considerably since the lessening of inter-tribal warfare, for their prime function was to provide a means of escaping the wholesale attacks and sieges which only occur in the inter-tribal head-taking raids. Log signal drums are now also relatively rare, due to the adoption of firearms, whose discharge is sufficient in itself to alert neighbors when an attack occurs.

A decline has occurred in the last three or four decades in the numbers of pigs kept, which is ascribed primarily to the fact that *tsantsa* feasts now have become much less frequent due to the lessening of inter-tribal warfare. The raising of pigs was primarily directed towards having a large supply of meat for such feasts. The capturing and taming of wild animals and birds has increased, however, because of the demand for these by Jívaro trading partners to the west, who trade them to the whites of the frontier.

Hunting has become more important as an activity to procure skins and feathers for trade, although there is no indication that such specialized hunting has resulted in an increase of meat consumption in the household. The adoption of firearms has tended to increase the hunters' efficiency in killing rare birds, such as the toucan, which are prized for their plumage and are difficult to stalk at close range. Firearms also have facilitated the hunting of dangerous wild animals for their skins, especially the jaguar and peccary, which were formerly hunted with the lance.

Besides firearms, blowguns and curare dart poison are also utilized for hunting to a greater degree than was the case several decades ago. The intensified use of blowguns has

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178 been made possible by the development of trade with the
184 Achuara, who are the main regional producers of blowguns
• 278 and curare. Formerly, blowguns and curare could only be
411 obtained in small quantities by looting Achuara houses after
438 a successful head-hunting raid.
[727]

In the case of fishing, no noticeable trends have occurred
178 except for a very minor increase in the use of hook-and-line
227 technique due to the acquisition of some steel fish hooks by
438 means of the inter-tribal trade network.

Wild food gathering has been marked by a decline in the
178 collection of the formerly important chonta palm fruit. This
222 decline in collection, interestingly enough, is attributed to
137 the introduction of the steel machete, whose efficiency, compared to the stone axe, made it easy for men to chop down chonta palms simply for their edible tips, thereby reducing the number of trees available as regular sources of the hanging clusters of fruit. In other words, the introduction of steel cutting tools, by contributing to the degradation of this wild food resource, decreased rather than increased food obtained from gathering.

178 Species of domesticated plants remain unchanged except
24 for two new additions, *papa china* and the onion, introduced by means of trading partners from the frontier Jívaro, who in turn had adopted them from the missionaries and Ecuadorian settlers. None of the aboriginal native crops has been abandoned within the memory of the informants.

[462] The sexual division of labor in agricultural activities is unchanged except for the relatively inconsequential harvesting of the small plantings of red pepper and sugar cane. Formerly, both sexes engaged in harvesting these, whereas now only women do. The decline of male interest in harvesting sugar
178 cane seems to be due to the fact that since the adoption of
278 firearms, blowguns and poisoned darts are rarely used any
411
824

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more in defending houses against attack. Sugar cane was the chief antidote against the curare dart poison, and men going on a killing expedition would carry some to suck on if hit by a dart.

Despite the efficiency of the steel tools and their increased supply, the quantity and quality of the artifacts produced through their use does not seem to have particularly changed. In other aspects of work, the machete has replaced the aboriginal bamboo knife for skinning animals and cutting meat, and has almost entirely taken the place of the palm-wood "machete" in clearing gardens of weeds. Steel needles obtained from the West have partially replaced bone ones for sewing and boring. The traditional bone needles, because of their large size, are still preferred for some tasks, especially the making of netted bags. A new minor craft is the fashioning of powder horns from unworked cow horns obtained from trading partners in the west, who secure them from the whites.

The preparation of animal skins for trade has increased considerably in order to acquire steel tools, shotguns, and gunpowder from the frontier Jivaro trading partners. Cordage manufacture remains unchanged, but the local production of knotted and knotless netting bags is a new development, learned from the Achuara tribe as a result of the increased peaceful contacts by trading partners.

Western-manufactured clothing, along with trade cloth and glass beads, has been adopted gradually by men and women as a result of the development of the trading partnership system. The increased trade has also resulted in the acquisition of Achuara-woven cotton kilts. The acquisition of both Western and Achuara items of dress has greatly contributed to a decline in the home weaving of garments by Jivaro. Bark clothing, viewed as a sign of poverty, has be-